Comparing coefficients → $ax^2 + bx + c = 0$

a is the coefficient of x^2

Do now:

A. $A = \pi r^2$ ✓	B. $abc = cba$ ✓	C. $b^2 + 2b - 7 = 0$ ✓
D. $S = D \div T$ ✓	E. $6a \div 2 = 3a$ ✓	F. $x^2 + x^2 = 2x^2$ ✓
G. $3y = 2y + 10$ ✓	H. $3x + 9 = 30$ ✓	

Identity	Equation	Formula
$abc \equiv cba$	• $3x + 9 = 30$	$A = \pi r^2$
$\frac{6a}{2} \equiv 3a$	$x = 7$	$S = \frac{d}{t}$
$x^2 + x^2 \equiv 2x^2$	one solution	
	• $3y = 2y + 10$	
	• $b^2 + 2b - 7 = 0$	
	• $\sin(x) = \frac{1}{2}$	

Identity – is an equation that is true for any value

Equation – is an equality with a finite set of solutions

Formula – A rule or fact, written in mathematical symbols

2.

$(m^3)^4 = m^{12}$	$F = ma$	$(2x - 4)(3x + 8) = 24$
$a^5 \times a^4 = a^9$	$3x + 6y = 20$	$w^7 = 7$
$x^{\frac{1}{2}} = \sqrt{x}$	$A = \frac{1}{2}(t + b) \times h$	

3.

$10x^3 + 5x = 5x(2x^2 + 1)$	$A = \frac{1}{2}ab \sin C$	$a = \sin A \times b \div \sin B$
$\sin x = x$	$a^2 = b^2 + c^2 - 2bc \cos A$	$9x^2 - 16 = (3x + 4)(3x - 4)$
$\sqrt{x + 1} = x^3$	$\sin x \div \cos x = \tan x$	

IDENTITY

Worked example	You try
$3(x + 5) \equiv ax + b$ $3x + 15 \equiv ax + b$ COEFFICIENTS OF x: $a = 3$ CONSTANTS: $b = 15$	$2(3x - a) \equiv bx - 8$ $6x - 2a \equiv bx - 8$ $b = 6$ $a = 4$
$5x + 14 + ax - b \equiv 7x + 9$ $(5 + a)x + 14 - b \equiv 7x + 9$ COEFFICIENTS OF x: $5 + a = 7$, $a = 2$ CONSTANTS: $14 - b = 9$, $b = 5$	$2(2x + 3) + 3(5x + 2) \equiv ax + b$ $19x + 12 \equiv ax + b$ $a = 19$ $b = 12$
$(x + 3)(x + 5) \equiv x^2 + ax + b$ $x^2 + 8x + 15 \equiv x^2 + ax + b$ $a = 8$ $b = 15$	$(x + a)(x - 5) \equiv x^2 + bx - 15$ $x^2 - 5x + ax - 5a \equiv x^2 + bx - 15$ $-5a = -15$ $a = 3$ $-5 + a = b$ $b = -2$

k)

$2x^2 + 8x - 5 \equiv a(x + b)^2 + c$

$2x^2 + 8x - 5 \equiv a(x + b)^2 + c$

$2[x^2 + 4x] - 5$

$2[(x + 2)^2 - 4] - 5$

$2(x + 2)^2 - 13 \equiv a(x + b)^2 + c$

$a = 2 \quad b = 2 \quad c = -13$

l)

$2x^2 + ax - 1 \equiv b(x + 3)^2 + c$

$2x^2 + ax - 1 \equiv bx^2 + 6bx + 9b + c$

$b = 2$

$a = 6b = 12$

$9b + c = -1$

$18 + c = -1$

$c = -19$

Task – calculate the unknown values a, b and c

$(ax + 1)(x + c) + b \equiv 5x^2 + 11x + 8$ $ax^2 + acx + x + c + b \equiv 5x^2 + 11x + 8$ $ax^2 + (ac + 1)x + c + b \equiv 5x^2 + 11x + 8$ $a = 5$ $ac + 1 = 11$ $ac = 10$ $5c = 10$ $c = 2$ $c + b = 8$ $2 + b = 8$ $b = 6$	$3(ax + 1) - (6x + b) \equiv 21x - 8$ $a = 9$ $b = 11$

$(ax + 5)(x - b) + 4x \equiv 2x^2 + cx - 10$

$a = 2$

$b = 2$

$c = 5$

$4(3x + a) + 5(ax + b) \equiv 22x + 28$

$a = 2$

$b = 4$

$4x^2 + ax + 3 \equiv b(x + 1)^2 + c$

$a = 8$

$b = 4$

$c = -1$

$\dfrac{ax^2 + x - b}{x + 2} \equiv x - 1$

$a = 1$

$b = 2$

$2(5x + 1)(3x + b) + ax(2x + 3) \equiv 44x^2 + 37x + c$

$a = 7$

$b = 1$

$c = 2$

$(e - 2\sqrt{3})^2 = f - 20\sqrt{3}$

where e and f are integers.

$(e - 2\sqrt{3})(e - 2\sqrt{3}) = e^2 - 2e\sqrt{3} - 2e\sqrt{3} + 12$

Find the value of e and the value of f

$e^2 - 4e\sqrt{3} + 12 = f - 20\sqrt{3}$

$-4e = -20$

$e = 5$

$e^2 + 12 = f$

$25 + 12 = f$

$f = 37$

Given the identity below, find the value of s and t.

$$s^2\underline{a} + (2t-1)\underline{b} \equiv (4-4s)\underline{a} + t^2\underline{b}$$

$\overrightarrow{xy} = \overrightarrow{xy}$

a

$s^2 = 4 - 4s$

$s^2 + 4s - 4 = 0$

$(s+2)^2 - 8 = 0$

$s + 2 = \pm\sqrt{8}$

$s = -2 \pm 2\sqrt{2}$

b

$2t - 1 = t^2$

$0 = t^2 - 2t + 1$

$0 = (t-1)^2$

$t = 1$

Given the identity below, find the value of s and t.

$$ta + t^2b \equiv (s-3)a + (s+3)b$$

$t = s - 3$ (1)

$t^2 = s + 3$ (2)

$(s-3)^2 = s + 3$

$s^2 - 6s + 9 = s + 3$

$s^2 - 7s + 6 = 0$

$(s-6)(s-1) = 0$

$s = 6 \quad s = 1$

when $s = 6$ $t = 3$

$s = 1$ $t = -2$

- DFM → FUNCTIONS
  - INVERSE
  - COMPOSITE
  - DOMAIN + RANGE
- PAST PAPER PRACTICE.